

Single-line Laser Scan Module



Quick Reference Guide



590-0A51ME-001

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Radio Notice

This equipment generates uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual, it may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to EN55022 and 47 CFR, Part 2 and Part 15 of the FCC rules. These specifications are designed to provide reasonable protection against interference when operated in a commercial environment.

Radio and Television Interference

Operation of this equipment in a residential area can cause interference to radio or television reception. This can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.

- Relocate the device with respect to the receiver.

- Move the device away from the receiver.

- Plug the device into a different outlet so that the device and the receiver are on different branch circuits.

If necessary the user may consult the manufacturer, and authorized dealer, or experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402 U.S.A., Stock No. 004000003454.

For CE-countries

This scanner is in conformity with CE standards. Please note that an approved, CE-marked power supply unit should be used in order to maintain CE conformance.

Laser Safety

The laser scanner complies with safety standard IEC 60825 -1 for a Class I laser product. It also complies with CDRH as applicable to a Class IIa laser product. Avoid long term staring into direct laser light.

Radiant Energy: The laser scanner uses one low-power visible laser diodes operating at 650nm in an opto-mechanical scanner resulting in less than 3.9 μ W radiated power as observed through a 7mm aperture and averaged over 10 seconds.

Do not attempt to remove the protective housing of the scanner, as unscanned laser light with a peak output up to 0.8mW would be accessible inside.

Laser Light Viewing: The scan window is the only aperture through which laser light may be observed from this product. A failure of the scanner motor, while the laser diode continues to emit a laser beam, may cause emission levels to exceed those for safe operation. The scanner has safeguards to prevent this occurrence. If, however, a stationary laser beam is emitted, the failing scanner should be disconnected from its power source immediately.

Adjustments: Do not attempt any adjustments or alteration of this product. Do not remove the protective housing of the scanner. There are no user-serviceable parts inside.

Caution: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Optical: The use of optical instruments with this product will increase the eye hazard. Optical instruments include binoculars, magnifying glasses, and microscopes but do not include normal eye glasses worn by the user.

General handling precautions

- Do not dispose of the scanner in fire.
- Do not put the scanner directly in the sun or by any heat source.
- Do not use or store the scanner in a very humid place.
- Do not drop the scanner or allow it to collide violently with other objects.
- Do not take the scanner apart without authorization.

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1. Introduction

This model is small-in-size, light-in-weight, durable-in-structure and fast-in-reading, an overwhelming fixed position scanner in the industrial market.

The device is the optimized choice to meet fast-reading requirement. With single-line laser scan engine embedded, it offers a reading rate of over 500 scans per second. Its hardware decode technology provides the real-time decoding that effectively shortens customers' transaction time. And, it also supports multi-interface, including RS-232, keyboard, USB and RS-485.

It is featured with the sleeping mode in which its laser would be shot down as well as its motor followed, hence minimizes its electricity consumption for energy-saving purpose. Additionally, its scanning job is performed automatically once a barcode reaches the scan window, which means no necessary to push any button to proceed scanning.

This fixed position scanner works perfectly inside retailing price-checking machines, kiosks, medical devices and etc, aiming to provide easy-to-use and reliable user experience.

- Superior optical performance with a guaranteed minimum resolution of 0.127mm.
- Maximum reading distance of 200mm when reading 100% UPC/EAN, laminated or acrylic-covered barcodes.
- Good read LED indicator and tone programmable beeper.
- Built-in decoder allows automatic recognition of most barcode symbologies, which can be configured by scanning the programming menu.
- Flexible scan trigger configurations.
- Simplified command programmable via RS-232C interface.
- IR sensing for quick scanner wake up when scanner enter sleep mode

2. Unpacking the Scanner

The single-line laser scan module package should contain:

- 1ea. Single-line laser scan module with attached interface cable
- 1ea. 5V power adapter (model depends on electrical requirements)
- 1ea. Quick reference guide (this book)

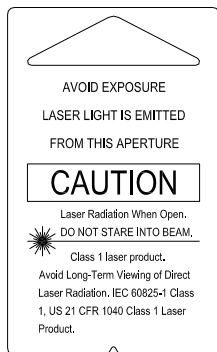
Please check for any damaged or missing items; contact your dealer if there is a problem.

3. Safety Label

The Scanner complies with safety standard IEC60825-1 for a class I laser product.

It also complies with U.S.21CFR1040 as applicable to a class IIa laser product.

Avoid long term viewing of direct at laser light.



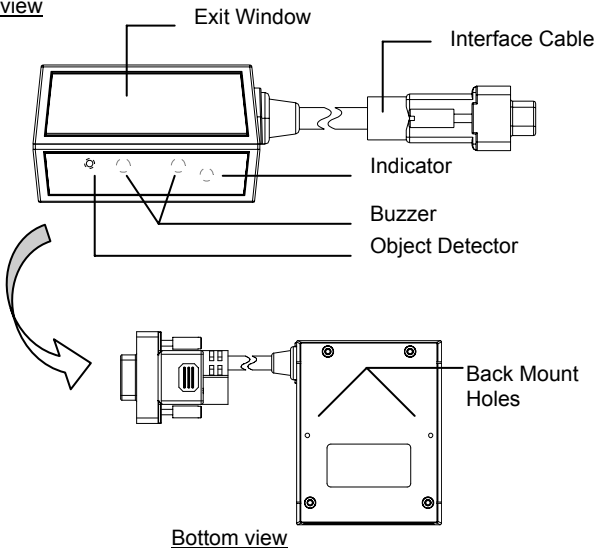
This equipment generates uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual, it may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to EN55022 and 47 CFR, part2 and Part 15 of FCC Rules. These specifications are designed to provide reasonable protection against interference when operated in a commercial environment.

For CE-countries:

- The Scanner is in conformity with the CE standards. Please note that an approved, CE-Marked power supply unit should be used to conform to these standards.

4. Scanner Outline

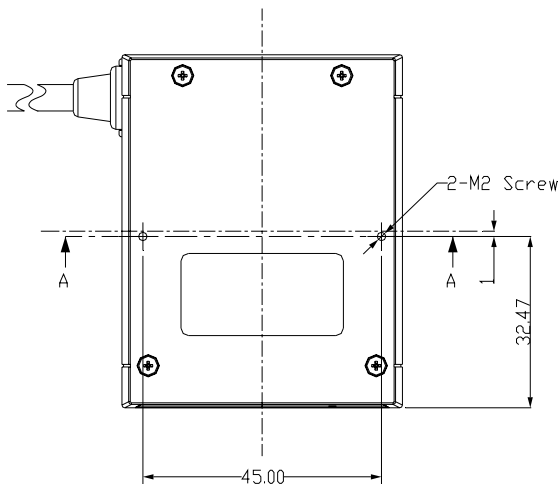
Front view



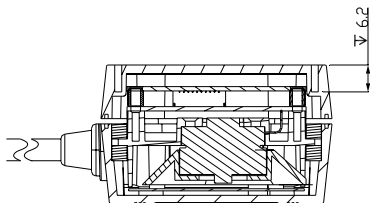
Description	Function
Exit Window	Reads barcodes
LED Indicator	When power is on, LED turns Red; for a good read, green light blinks.
Interface Cable	For interface communication and power supply.
Product Serial Label	Contents the model name and serial no., please do not remove.
Beeper	A single tone beeps indication.
Object Detector	Trigger and wake up scanner when presenting barcode in its range
Back Mount Hole	To fix the scanner with your host instrument.

5. Install Scanner

There are two back mount holes at the bottom of the scanner, which allows easily mounting the scanner onto the host instrument with only two screws.



Screw Size:M2 x 0.4 x 6 mm



To correctly mount the scanner onto the host device, follow the steps below:

1. Locate the device in a dry position to avoid direct sunlight, bright or laser light from other source.
2. Before mounting ensure sufficient clearance at the rear of the scanner to allow for the connector and cable
3. Use the measurements provide in the figure to locate centers of mounting holes and drill two 2.2mm holes.
4. Secure scanner with two M2x0.4-6mm screws.

Caution

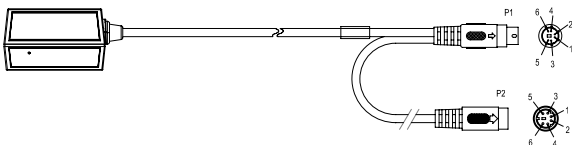
- Do not allow the mounting screws to penetrate into the scanner case more than 0.235in(6mm) or damage to the scanner may result
- To prevent twisting or distorting the scanner housing, ensure that the mounting surface or bracket is flat.

6. Connecting

The interface cable comes with different host-end connectors, depending on the host. Follow the steps below to connect the interface cable to the host.

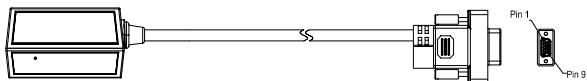
1. Make sure that the power of the host system is off.
2. Connect the host end of the interface cable to the appropriate connector on the host system.
3. For those cases where external power is used, plug the external AC power adapter into the jack on the interface cable.
4. Turn on the host system.

Keyboard Wedge Interface



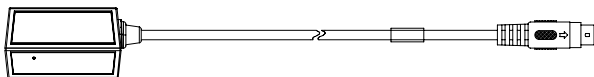
PIN-OUT CONFIGURATION			
MINI DIN (M)		MINI DIN(F)	
1	PC Data	1	KB Data
2	N.C.	2	N.C.
3	GND	3	GND
4	+5V	4	+5V
5	PC Clock	5	KB Clock
6	N.C.	6	N.C.

RS-232 Interface – DTE Pin-out



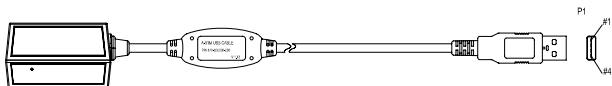
PIN-OUT CONFIGURATION	
DB9(F)	FUNCTION
2	TX
3	RX
7	CTS
8	RTS
5	GND
9	+5V Input

RS-232 Interface with trigger function



PIN-OUT CONFIGURATION			
MINI DIN 9P (M)	FUNCTION	COLOR	IN/OUT
1	TRIGGER	WHITE	IN
2	READ_OUT	PURPLE	OUT
4	CTS	ORANGE	IN
5	RTS	BROWN	OUT
6	RX	GREEN	IN
7	VIN	RED	-
8	TX	YELLOW	OUT
9	GND	BLACK	-

USB Interface

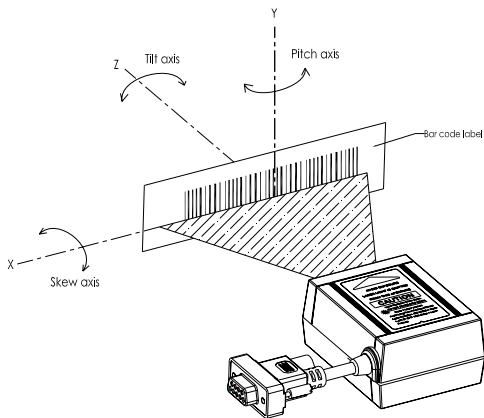


PIN-OUT CONFIGURATION	
USB TYPE A Connector	Function
1	VCC
2	D-
3	D+
4	VSS

7. Position Scanner and Label

Before testing the read rate and get its best performance, you will need to position the scanner and label in a manner that matches as nearly as possible the actual conditions of your application. The following points need to be noticed when mounting the scanner:

- (1) To avoid straight sunlight or any other bright light source illuminating.
- (2) When placing the barcode label, one must be careful not to over tilt, skew and/or pitch the barcode. (refer to drawing below)



- (3) To avoid putting the scanner in specula reflection position. If the angle between the scanner and the barcode is between specula reflection, therefore the laser light of the scanner will reflect straight back on the scanner. As to the internal sensor, it will not able to read any barcodes.

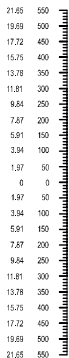
- (4) The barcode must be placed within the effective depth of field (D.O.F.) area. So-called “Depth of Field” is the effective reading distance for the barcode from the scanner. Its theory is like a camera, if the object is placed within the focal range, however the image appears clearly. But if the object is outside the focal range, the image then is blurred. The same theory could be applied to read the barcode. Therefore, different quality and density of barcodes could affect its D.O.F.; usually a lower piece or high density of barcode, its depth of field is shorter. Besides, it could be better to avoid using depth of field extremes range, this will prevent moving the barcode often and it easily could be move away from the reading range.

The best placing position please refers to the Decode Depth of Field drawing.

Quality Barcode Labels

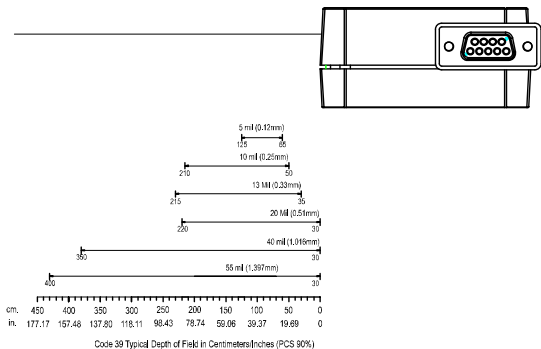
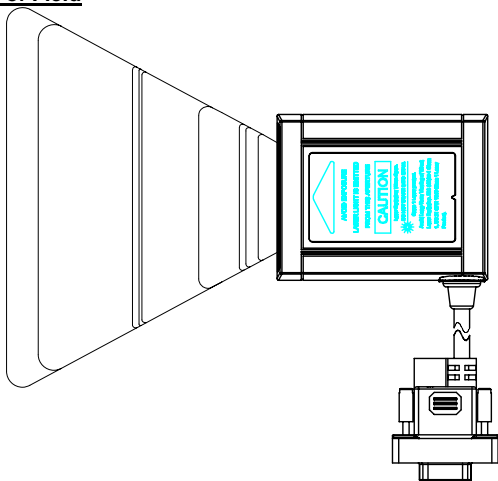
The quality of the bar code label can affect the scanning performance. Poor quality labels are more difficult to decode and may result in non-reads or potential misreads. The barcode label should be printed to specifications. This means that the bars are printed within spec, with the correct widths, no ink spread, crisps edges and no voids. There should be a sufficient quiet zone on both end of the barcode label. For best results, the paper or label stock should have a matte finish to diffuse light. The print contrast signal should be as high as practical.

Decode Depth of Field



in. mm.

Width of Field
in Millimeters
/Inches



Note: Near ranges on lower density barcodes (not specified) are dependent upon the width of the barcode and scan angle.

8. Quick Start

This Quick Start-Up procedure will get you started. However, to best understand the full capabilities of this scanner, you should read the complete manual.

1. Turn off the host system.
2. If it is necessary, plug the L-shaped plug of the power supply into the power jack on the cable.
3. Connect the power supply into an AC outlet. (Double check that the AC input requirements of the power supply matches the AC outlet.)
4. Connect the cable to the proper port on the host system.
5. Turn on the host system.
6. If the scanner is properly installed, the red-green LED will turn on once and beep 3 times.
7. Set the scanner to communicate with your particular POS terminal by scanning the appropriate barcodes. The programming varies on different terminals.
8. Verify that the scanner is successfully reading barcodes and transmitting the correct content to the terminal.

9. Read Rate Test

The read Rate test can help in determining the optimum position of the scanner, in this test the scanner continuously scans and decodes a barcode duration timeout (depends on label character length with slight difference) and then calculates the number of those scans that resulted in a good decode.

This number, expressed as a percentage, will be transmitted to the host.

For the factory default over 93% good decode will get a short beeper and show

OK, if under the 93% will get a serial beep.

The printout on the screen will appear as follows:

(Example) scan a code 39 label and value is "BARCODE TEST"

94%, BARCODE TEST, Good Code 39

Read Rate Test Label

Start of configuration



Read Rate test label



Note:

If the scanner is powered off or reset, the read rate test will ignore and will need to be set again.

10. Configuration Modes

This scanner has two programming modes.

Barcodes

This scanner can be configured by scanning the bar codes located under the “Programming Guide” section. Please refer to this guide for instructions.

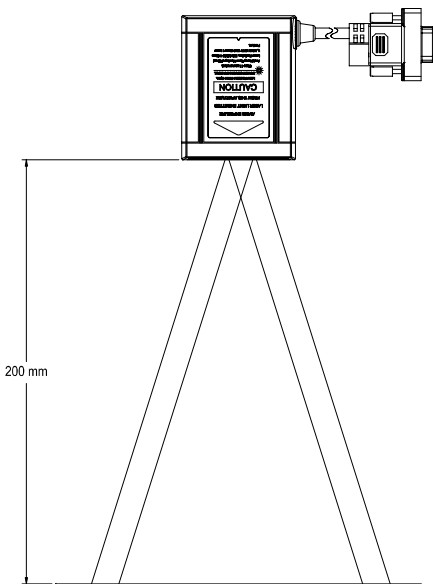
Serial Programming

This mode gives end-users the ability to send a series of commands using the serial port of the host system. For more information, please contact your dealer.

Regarding to configuration settings, please refer to the “Programming Guide” for further details.

11. Position Object Detector

When scanner is in object detect trigger mode for settings, the laser light is off. When there is an object presented in the scanning range, it automatically activates the laser light and decodes the barcode. Then the laser light remains in the timeout duration and turns off till next detection to trigger.



Note: Avoid putting object in front of a reflective background; this might affect the correctness of this function.

12. Visible Indicators

LED Status	LED Indication
Red, and Green LED are off	<ol style="list-style-type: none">1. Power off2. Scanner sets up as Trigger mode or IR Trigger mode
Steady Red	When the laser is active, the red LED is on. The red LED will remain until the laser is deactivated.
Single Green	A barcode has been successfully decoded.
Steady Green	<ol style="list-style-type: none">1. A barcode has been successfully decoded, but the object is not removed from the scan window.2. The scanner is in programming mode.
Steady Yellow	This indicates the scanner has a motor or laser failure. A beep is heard when a motor failure occurs. Return the unit for repair.
Alternate Red and Green Flashes	The scanner detects a power failure. Please check whether the power is properly connected.

13. Controlling the Scanner from Host System

The scanner can be controlled from the POS system via the RS-232C interface. Controlling can be accomplished by transmitting the following single byte commands to the scanner.

The default settings of the commands are as follow:

ASCII Code	Function	Byte is Also Called:
OE Hex	enable (resumes disable)	Shift Out or <Ctrl-N>
OF Hex	disable	Shift In or <Ctrl-O>
05 Hex	power-up re-initialization	ENQ or <Ctrl-E>
12 Hex	sleep	DC2 <Ctrl-R>
14 Hex	wake up (resumes sleep)	DC4 <Ctrl-T>

Function	Command
Level trigger enable	<ESC> A0 <CR>
Edge trigger enable	<ESC> A0. mm <CR>
Level trigger disable	<ESC> A1 <CR>

Note:

1. The edge trigger command that do not control by the trigger off command
2. Scanner will start the next scan if it receive a edge trigger command and the device remain "mm"
time,(mm=01~60,unit:second)

14. Sound Indicators

When the scanner is in operation, it provides audible feedback. The beeps indicate the status of the scanner.

Beep	Indication
One Beep	A barcode has been successfully decoded.
Three Consequent Beeps	This indicates that the scanner has passed the self-test and is operating properly. When the scanner is powered up.
Two Consequent Beep	This indicates that the scanner is in programming mode.
Continuous Beep Tone	This is a failure indication. Return the unit for repair.

15. Troubleshooting

Problem	Possible Cause	Solution
The scanner has no reaction; no LED, beeps, or laser	The power is not ON	Check your power and connection
The scanner is functioning but it is not decoding.	The label of the barcode might be disabled. The number of characters of the barcode label does not match the initial setting.	Enable the barcode type from the programming guide. Adjust the label length setting of the barcode type.
When using the KBW interface, the data transmission is slower than usual	The system is not compatible with the international ALT method.	Under properties, select the language property that is suitable for your keyboard.
A barcode is read but not accepted by the host device.	Either a wrong interface is selected or the interface is incorrectly set.	Check the interface, cable used and its settings.
Alternating red and green flashes	There is a power failure in this scanner.	Please check and see if the power is properly connected.
Steady Yellow(red/green) LED	There is a laser failure in the scanner.	Immediately power off the scanner and return the unit for repair.
Characters are being dropped.	The delay time in the inter-character needs to be increased.	Adjust the character delay time.

16. Specification

Electrical Characteristics

Specification	Value
Power	1 watts
Input Voltage	5VDC \pm 10%
Operating Current	Max. 200mA@5V

Environmental Conditions

Specification	Value
Operating temperature	0 °C ~ 45°C
Storing temperature	-20 °C ~ 60 °C
Operating humidity	5% ~ 90% (No dewing allowed)
Resistance to static electricity	Air: 10 KV Contact: 8 kV (Test conditions : Subject to IEC1000-4-2. 150 pF. 330 Ω)
Ambient Light Rejection	4500 LUX (fluorescence)

Optical Device

Specification	Value
Light Source	650nm visible laser diode.
Scan pattern	Single Line Scan
Pitch angle	$\pm 75^\circ$
Skew angle	$\pm 65^\circ$
Roll angle	$\pm 40^\circ$
Depth of field	35 ~ 215 mm
Scan Rate	500 scans/sec
PCS value	30% @ UPC/EAN, 100%

Safety

Specification	Value
Laser safety	CDRH class IIa, IEC 60825 class1
EMC compliance	CE EN55022,B, FCC part 15 Class A,VCCI,BSMI

17. Dimension

